Genetic Continuity Unit Test

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| K/U / 20 | T/I /13 | A /6 | C /6 |

**PART I: Multiple Choice**

1) During meiosis, alleles cannot be sorted independently if they are:

1. Dominant
2. Defective
3. Linked
4. Co-dominant

2) Mendel’s principle of segregations states that:

1. In a hybrid organism, only one of the two alleles will be expressed
2. Two alleles that determine a characteristic will separate when sex cells are formed
3. The allele that is expressed is the dominant allele
4. The inheritance of a particular allele is not affected by the inheritance of another allele unless it is on the same chromosome

3) An example of incomplete dominance for flower colour can be seen when red flowers are crossed with white flowers to produce:

1. Beige flowers
2. White flowers
3. Pink flowers
4. Red flowers

4) How do daughter cells at the end of mitosis and cytokinesis compare with their parent cell when it was in G1 phase of cell cycle?

1. The daughter have half the amount of cytoplasm and half the amount of DNA.
2. The daughter cells have half the number of chromosomes and half the amount of DNA.
3. The daughter cells have twice the number of chromosomes and twice the amount of DNA.
4. The daughter cells have the same number of chromosomes and the same amount of DNA.

5) A haemophiliac man marries a woman whose father had haemophilia. If they have a son, what is the chance that he will have haemophilia?

1. 100%
2. 0%
3. 50%
4. 25%

6) An example of non-disjunction is:

1. Haemophilia
2. ABO blood system
3. Sickle cell anemia
4. Down’s syndrome

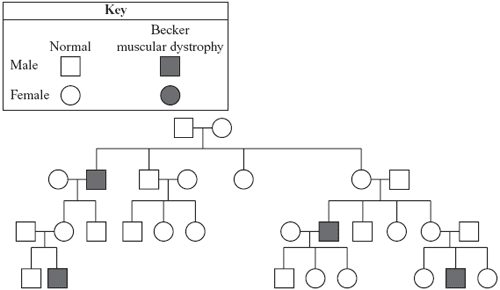
7) Which types of gametes would be produced by a plant of the genotype AABbCc

1. AA, Bb, and Cc
2. ABC, AbC, and Abc
3. ABC only
4. None of the above

8) In a test cross, the unknown genotypes is always crossed with:

1. A purebred dominant
2. A purebred recessive
3. A hybrid
4. All of the above

9) The pedigree below shows the occurrence of Becker muscular dystrophy in a family. Becker muscular dystrophy causes muscle weakness.



Based on this pedigree, it is most reasonable to conclude that Becker muscular dystrophy is:

1. A sex-linked trait
2. A polygenetic
3. A co-dominant trait
4. An autosomal dominant trait

10) If both parents possess the genotype AaBb, the F1 generation will exhibit the genotypic ratio of:

1. 1:2:1
2. 9:3:3:1
3. 3:1
4. 2:1:2

11) Phenotype variation in the ABO blood system is due to:

1. Polyploidy
2. Multiple genes
3. Multiple alleles
4. Sex-linked traits

12) Mendel’s “factors” that determine traits are now called:

1. Chromosomes
2. Alleles
3. Gametes
4. Genes

13) The genotypes AaBBCcDDeeff for skin colour shows that skin colour is:

1. Sex linked
2. Influenced by one gene pair
3. Influenced by many gene pairs
4. Has six variations

14) What are translocation, inversion, and additions associated with?

1. Non-disjunction
2. Gene mutations
3. Different alleles
4. Chromosomal mutations
5. The gametes of a cat contain 19 chromosomes. Therefore, the skin cells should contain:
6. 9 chromosomes
7. 19 chromosomes.
8. 38 chromosomes.
9. Haploid number of chromosomes.

16) In pea plants, the genes for seed colour and seed shape are on different chromosomes. Which of the following explains why the genes for these traits are not inherited together?

1. Natural selection
2. Artificial Selection
3. The law of segregation
4. The law of independent assortment

17) A pedigree is a diagram that traces the inheritance of a trait through a family. Which of the following patterns is typical in a pedigree for an autosomal dominant trait?

1. The trait affects only males.
2. The trait appears in every generation.
3. The trait appears in only one-fourth of the individuals.
4. The trait affects all the individuals of the second generation.

18)  In a certain variety of chicken, some offspring have a feather pattern that is black-and-white checkered. Chickens with this checkered feather pattern result from the cross of a black chicken with a white chicken. Which of the following types of inheritance is most likely responsible for the checkered feather pattern?

1. Co dominant
2. Dominant
3. Polygenic
4. Sex-linked
5. Cytokinesis usually, but does not always, follow mitosis. If a cell undergoes mitosis and NOT cytokinesis, what would be the result?
6. A cell with two or more nuclei.
7. Many cells with no nucleus.
8. A cell with a single large nucleus.
9. Many cells with different types of function

20. If an organism with the genotype DDRR was crossed with an organism with the genotype ddrr, the F1 generation would be:

1. Purebred
2. Half purebred, half hybrid
3. All hybrid
4. All recessive

**PART II: Genetics Problems**

1. Create a chart to illustrate the number of chromosomes in the following list of cells before, during and as a result of meiosis. (C /3)

2. A scientist produces a new strain of seeds using genetic engineering. What process, mitosis or meiosis, would the seed go through when germinating into a mature plant? Would the seeds produced by the mature plant be identical or different form the original genetically engineered seeds? Explain. (A /2)

3. In studies of a particular vegetable, plants with crinkled leaves are crossed. In the F1 generation the following plants are found: 192 with straight leaves, 410 with crinkled leaves, and 214 with curly leaves. List the genotypes of the 3 types of plants. (T/I /3)

straight leaves: \_\_\_\_\_\_\_

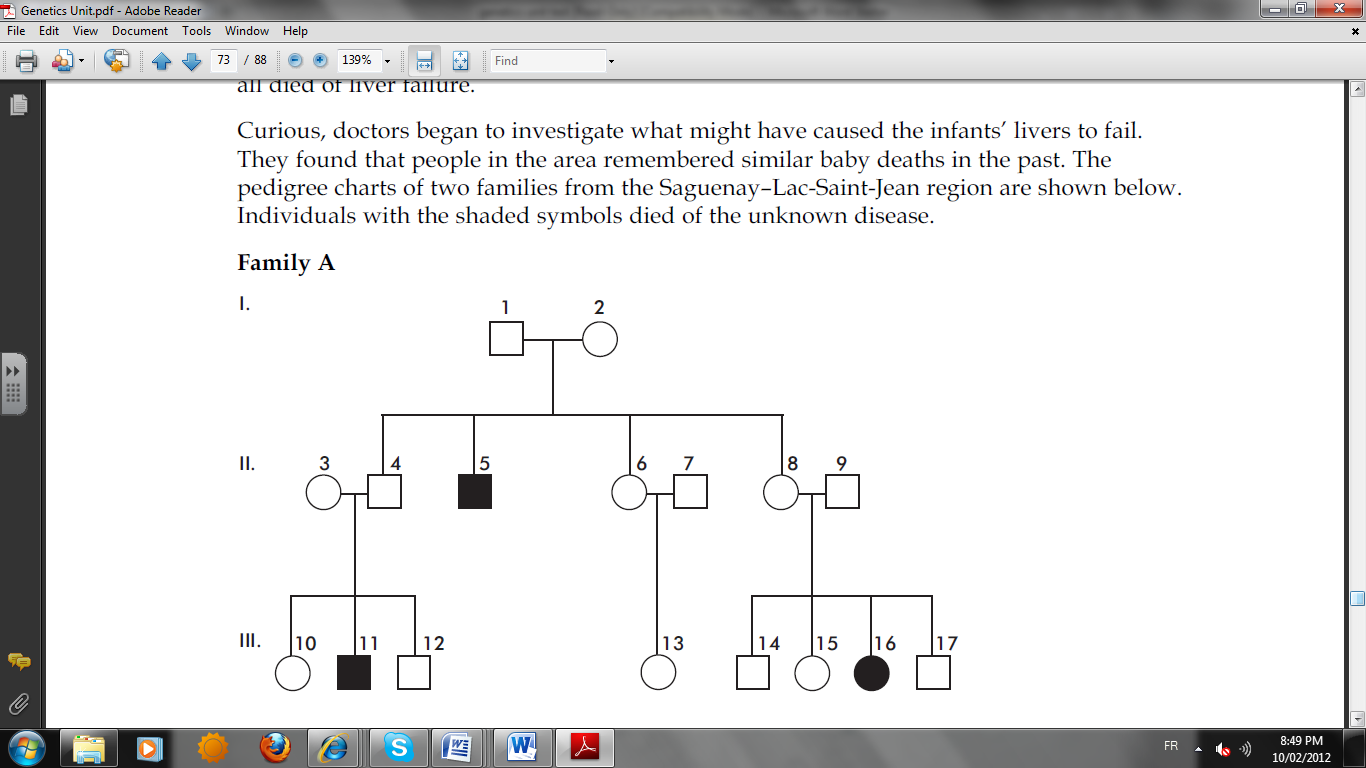
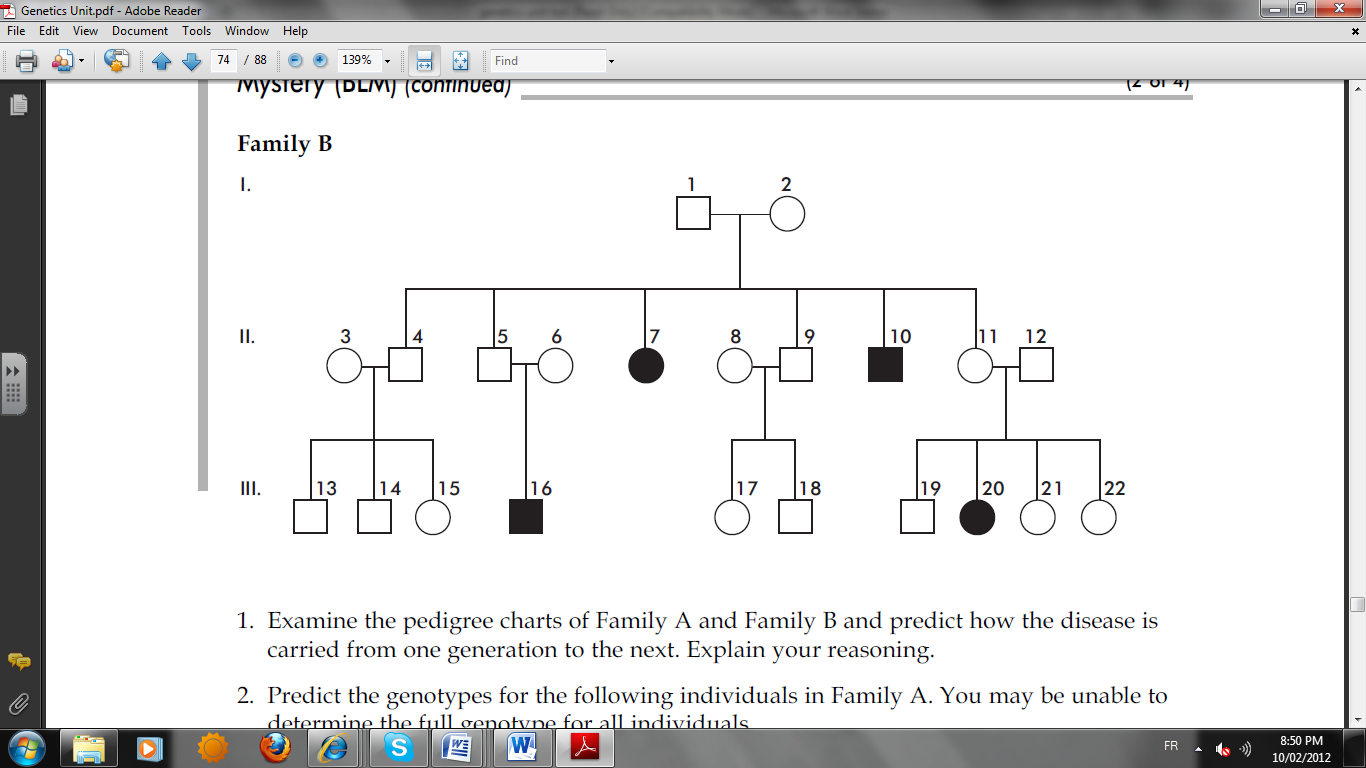
crinkled leaves: \_\_\_\_\_\_

curly leaves: \_\_\_\_\_

4. A wealthy elderly couple dies together in an accident. Soon a man appears to claim their fortune, contending that he is their only child. Other relatives dispute this claim. Hospital records show that the deceased couple had blood types AB and O respectively. The claimant to the fortune is type O. Do you think the claimant is an impostor? Explain your answer. (C /3)

5. Given that the majority of the mutations that occur in the human populations have undesirable effects and a mutation is rarely beneficial, why do we say that mutations have an important role to play? (T/I /2)

6. Genetic Testing can help to identify genes associated with various diseases. What are the positive and negative aspects of this? (A /4)

1. In the early 1960s, some pediatricians in the Saguenay–Lac-Saint-Jean region of Quebec noticed that some infants in the area were dying from an unknown disease. The babies seemed to be healthy when they were born, but they did not eat well or gain weight as they should. Autopsies showed that the children all died of liver failure. The pedigree charts of two families from the Saguenay–Lac-Saint-Jean region are shown below. Individuals with the shaded symbols died of the unknown disease.
2. Examine the pedigree charts of Family A and Family B and predict how the disease is

carried from one generation to the next. Explain your reasoning. (T/I /3)

1. Individual III–10 from Family A and Individual III–19 from Family B plan to start a family together. What is the chance they could have a baby with the disease? Explain. (T/I /5)